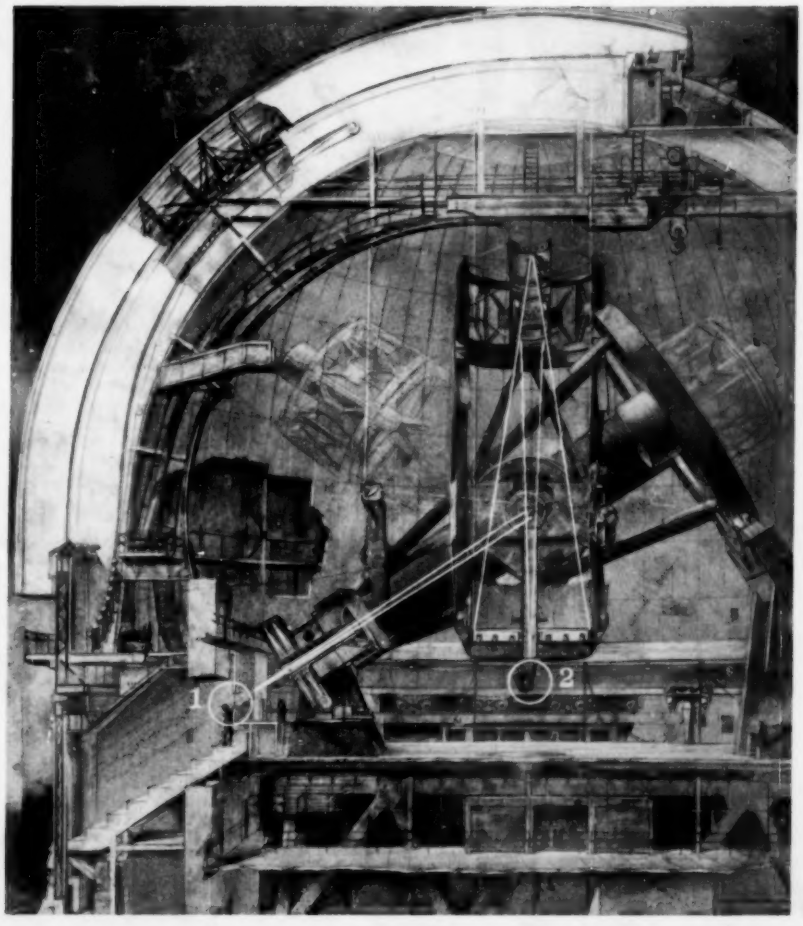
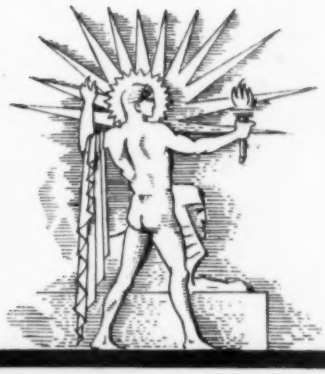
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





November 12, 1938

Ready for Assembly

See Page 308

A SCIENCE SERVICE PUBLICATION

Do You Know?

Scientists are finding that the floors of all the oceans are more uneven than they supposed.

Before lenses were invented, rounded flasks of glass were filled with water and used to read small lettering.

The temperature of Spitsbergen, north of Scandinavia in the Arctic, has risen about ten degrees in less than 50 years.

Tattooed ladies are as old Babylonia and ancient Egypt, for 5,000-year-old figurines of women show this form of art.

Malay natives tip darts with poison sap from the upas tree, but there is no truth in tales that the tree's poison can kill birds that merely fly around it.

Flowers representing all the States have been sent to the New York World's Fair to be included in the "floral cornerstone" of the Horticultural Hall.

A gas-proof chamber for dogs and other small animals has been devised as result of British pet owners' concern for their animals in event of air raid.

Because many people have a fear of being shut in when they visit cold locker rooms, an Ohio man has invented a refrigerated locker storage system whereby a customer's own locker is hoisted up to him in a warm room when he wants to store or remove meats and vegetables.

QUESTIONS DISCUSSED IN THIS ISSUE

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ARCHAEOLOGY

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RADIO

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STANDARDS

What is the minimum standard for a quality mark on gold? p. 313.

ZOOLOGY

Why was the white bison once considered a sacred animal? p. 307.

A ticker tape method of recording eye movements behind closed lids has been devised.

Discovery of a mammoth tusk six and a half feet long was recently reported in eastern Soviet Russia.

Tuberculosis is reported to be 13 times as prevalent among diabetic children as among those who do not have diabetes.

Rubber clothespins are news for wash day.

A British horticulturist says that no plant taxes the skill of the gardener so much as the common mushroom.

In the twelfth century B. C. in Egypt, the holdings of the god Amon included 86,000 slaves, 420,000 cattle, much land, 83 ships, 46 workshops, 65 towns.

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PUBLIC HEALTH

Potential Health Menace In New Yellow Fever Mosquito

Aedes triseriatus, Which Flies From Maine to Florida And West to Montana, Is Found To Be Potential Carrier

A NEW potential danger to health has appeared in the form of a widely distributed mosquito that can carry the virus of deadly yellow fever. Discovery of the mosquito's ability to carry this virus is reported by Drs. Byron L. Bennett, Fred C. Baker, and Andrew Watson Sellards. (*Science*, Oct. 28) The find was made in studies at Harvard and Cornell Universities.

Yellow fever is ordinarily carried by the Aedes aegypti mosquito, which is found chiefly in tropical and semitropical regions, occasionally getting as far north as Philadelphia in the summer. The new yellow fever carrier, Aedes triseriatus by name, is distributed from Maine to Florida and as far west as Montana.

Yellow fever does not exist in the United States today. If, however, a few cases should by a remote chance slip through the quarantine lines, the disease could, with the aid of the newly-discovered carrier, sweep across almost the entire country.

The fact that triseriatus has been discovered to be a yellow fever carrier only under laboratory conditions suggests that it probably is not a natural carrier of the disease. If it were, it seems likely that its role would have been discovered much sooner.

Unsolved Problem

Yellow fever, however, has recently proved to be much more of an unsolved problem than it was considered a decade ago or even five years ago. After the demonstration by Walter Reed and his associates that yellow fever was carried by the aegypti mosquito, everyone thought eradication of the disease through mosquito control measures was quite possible.

These measures did suffice to free the United States of the disease, but efforts to do the same in Africa and South America have not been so successful. One reason, Rockefeller scientists recently found, is the fact that yellow fever, disguised under the name of jungle fever, exists in much wider territory than supposed. Another reason is the discovery that it can be carried by insects other than the ordinary yellow fever mosquito. Scientists have recognized this for some time before the present discovery of triseriatus as a yellow fever carrier.

Expansion of rapid air travel has brought the yellow fever areas dangerously close to regions like the United States that considered themselves safe from this much-dreaded ailment. This has provided another complication in the yellow fever control problem.

The one fortunate aspect of the situation is the success of the anti-yellow fever vaccine developed by Rockefeller Foundation scientists within the past few years. Persons living near or in yellow fever areas can be protected by this vaccine and it can also be used to check the spread of yellow fever by giving it to air crew and passengers coming from yellow fever regions.

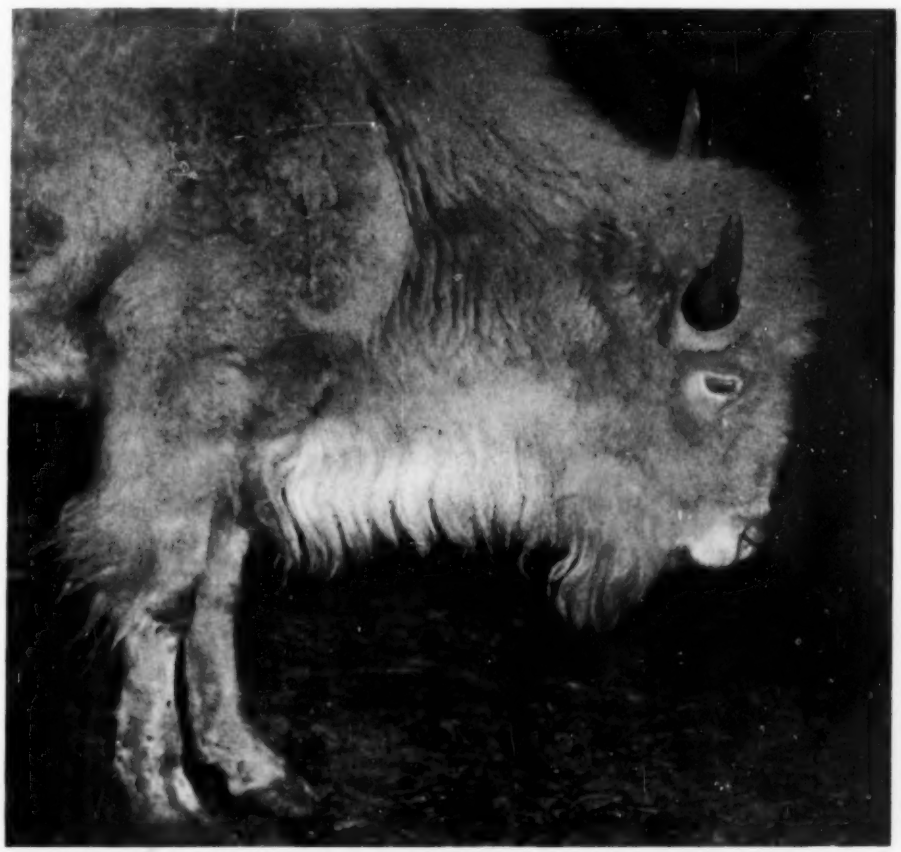
Science News Letter, November 12, 1938

ZOOLOGY

National Zoological Park Has White Bison Bull

A WHITE bison bull, an animal rarer even than the sacred white elephant of Siam, is an inmate of the National Zoological Park. The albino animal was born on the National Bison Range near Moiese, Mont., and was presented to the zoo by the U. S. Biological Survey.

White bison were great rarities even in the days of the vast herds on the western plains, a couple of generations ago. The Indians considered them sac-



RARE

Any bison is rare enough, but a white bison bull like this is rarer than the sacred white elephant of Siam. This one is at the National Zoological Park.

red. One plains tribe, the Atsina, used to kill large numbers of bison by driving them over cliffs. But if they found one white animal in the mass thus slaughtered wholesale, only the direst necessity could drive them to take the meat or hides of any part of the whole herd.

Science News Letter, November 12, 1938

PHYSIOLOGY

Vitamins From A to Z Are Fact, Not Fancy

THE IDEA of the vitamin alphabet stretching from A to Z is no idle myth. It really does. Fortunately, however, you need not remember all of them when you sit down at the dinner table.

Vitamins V, X, and Z, to start at the wrong end of the alphabet, are only important in the nutrition of bacteria. Some of the other end-of-the-alphabet vitamins are a necessary part of insects' diets.

T is about as high as vitamins for higher animals go. Vitamin T is found in egg yolk and sesame oil. It increases the number of platelets in rat and human blood. Platelets play a part in making the blood clot so you won't bleed to death after a cut.

About midway in the alphabet there is vitamin L, found in yeast and liver, and needed by young mother rats for nursing their first litter. Another midway vitamin is P, a substance closely related to anti-scurvy vitamin C, and also found in lemon juice and red peppers. A newcomer among the vitamins, its exact function is not certainly known, but it seems to help the body retain vitamin C.

New and unlettered vitamins are a gizzard erosion factor found in grain and needed by young chicks, and a grass juice factor that influences growth in rats.

Going to the other end of the alphabet, there is growth vitamin A, probably formed in the liver from the yellow coloring substance of foods like carrots and butter. Vitamin B has been split into at least nine parts. Most important are the first three: thiamin, nicotinic acid (prevents pellagra) and riboflavin. Vitamin C, from fruits and vegetables, prevents scurvy. Vitamin D, from sunshine or cod liver oil, prevents rickets. Vitamin E, from wheat germ, is necessary for reproduction. Vitamin K, another newcomer found first in alfalfa, prevents hemorrhage in some conditions.

Science News Letter, November 12, 1938

ASTRONOMY

Telescope Mounting Awaits Assembly at Mt. Palomar

Pieces Weighing as Much as 50 Tons Have Made Trip Up Winding Mountain Road and Are Laid in Position

See Front Cover

THE mounting for the great 200-inch telescope of the California Institute of Technology lies in pieces in the huge telescope dome on Palomar Mountain following a unique transportation job.

Pieces weighing as much as 50 tons each had to be taken by truck and trailer up the winding road that leads to Mt. Palomar's peak, destined in a short time to be the mecca for astronomy. Loads had to be transferred from one trailer to another at sharp turns in the road and sometimes top-heavy pieces had to be guyed to stone ballasts on auxiliary trucks to keep them from toppling where the road banked. But in expert hands the job went without mishap.

The last and largest of three shipments has now reached the observatory from San Diego, where they had come by steamer from the machine shops of the Westinghouse Electric and Manufacturing Company in South Philadelphia. More than half of the 300-ton load was contained in the bearing for the northern end of the telescope mounting. It arrived in three chunks, each weighing more than 50 tons.

When put together with dowel pins again these pieces will make up an accurate 30-foot circle with a V-shaped bite taken out of it so that the telescope can look right up along the axis of rotation to the North Pole in the sky.

The various structural parts, including the bearings and the 60-foot tube, are now laid out on the floor of the dome in positions carefully planned to facilitate assembly. Capt. Clyde MacDowell, supervising engineer for the project, arranged for everything to dovetail even though there were no precedents for such a job.

A special 70-ton crane had to be purchased for the occasion and it was a ticklish matter to lift the massive parts from the rolling ships with the floating crane.

While the structural parts are being assembled, the optical work on the mirror itself is proceeding smoothly in Pasadena.

The illustration on the cover of this week's SCIENCE NEWS LETTER shows the dome in cross-section as pictured by Russell W. Porter, of the California Institute of Technology.

The telescope proper is the vertical structure while its massive mounting points upward to the right. The longest focal length, and the largest images, are obtained with the coude form of use in which the observer (1) standing at the left looks up the polar axis of the telescope mounting. In the coude form the light rays enter vertically downward, are reflected back up to a smaller convex mirror at the top, then back down to a small plane mirror and hence down the polar axis to the observer. In the Cassegrainian form the rays leave the great 200-inch mirror, go upward to a convex mirror and then back down and out through a hole in the great mirror to an observer in position (2). When used at its principal focus an observer (3) sits in a small cage near the top of the telescope and observes with only a single reflection off the great mirror. This is done where weak light requires a minimum of light losses due to multiple reflections. The aperture of the telescope at principal focus is f 3.3, at Cassegrain focus f 16 and at coude focus f 30.

Science News Letter, November 12, 1938

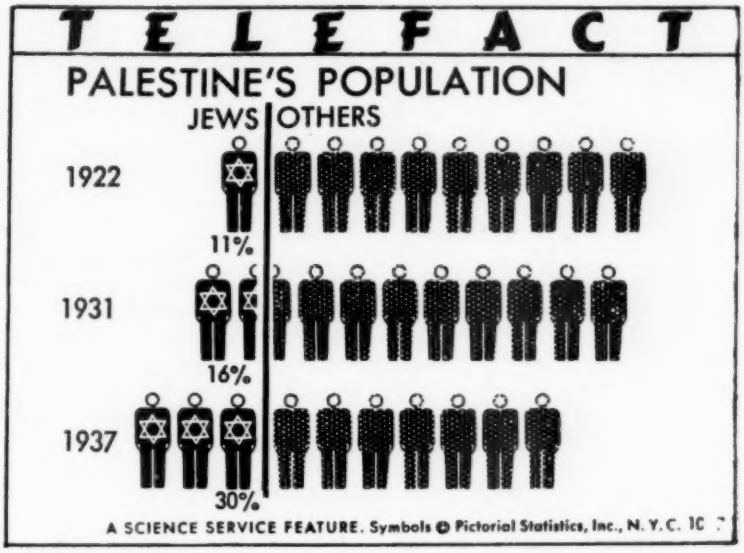
MEDICINE

No Nobel Prize Awarded In Medicine This Year

THE Nobel Prize in medicine will not be awarded for 1938, the Caroline Institute has decided. The money will be funded until next year.

Science News Letter, November 12, 1938

Tularemia is never transferred from man to man: infection comes from contact with an infected rabbit or other small field animal or from an insect that has fed upon an infected animal.



GENERAL SCIENCE

Scientific Facts Now Are Presented in Picture Form

New Technique, Which Originated in Vienna, Now Is Available to American Newspapers in Telefacts

IN TELEFACTS—little picture diagrams, one of which appears on this page,—Science Service is supplying to newspapers and magazines science in a new dress. *Telefacts* will appear in the SCIENCE NEWS LETTER from time to time.

Pictorial statistics were born in Vienna in the early 1920's. Vienna was facing a tremendous educational task. The war had left the city with depleted finances, a terrific infant mortality, appalling housing conditions. The depression had swept away all basis for budgeting. The complete taxation system had to be replaced, houses had to be built, kindergartens and clinics established. The whole task needed the understanding and cooperation of the entire population.

But how could a starving population be interested in housing taxes, in budgeting, in infant mortality? Pictorial statistics were the answer. The Social Museum in Vienna was filled with them; the people came by thousands to study them and their own problems.

In the early 1930's pictorial statistics crossed the Atlantic. Rudolf Modley, who was Assistant to the Director of the Social Museum in Vienna became Curator of Social Sciences at the Museum of Science and Industry in Chicago. In 1934 he became Executive Director of Pictorial Statistics, Inc., and consultant for many government agencies. Modley is author of "How to Use Pictorial Statistics" and co-author with Louis M. Hacker of "The United States, a Graphic History." This year, in collaboration with Harry B. Coffin, he began production of *Telefact* which is now being distributed by Science Service.

Leading newspapers are now using these pictorial graphs to keep their readers informed of current scientific and economic facts.

Pictorial statistics developed, Mr. Modley explains, from an analysis of the shortcomings of the conventional graphs. One bar chart looks like any other bar chart. Thus a chart showing the growth in the circulation of a magazine may look exactly like one showing the number of deaths from cancer over a period of time. Isn't there something wrong with a graphic method of presentation in which this may happen?

Pictorial statistics turns to the experiences gained from the study of the picture languages. It introduces self-explanatory pictorial symbols to replace the enigmatic bars and curves. A drawing of a hut stands for a hut, a picture of a cow for a cow. A magazine has a standard appearance so that a simplified reproduction of the magazine might be a logical symbol.

With cancer it is not so easy to make a quick direct connection between symbol and subject. Thus cancer deaths may have to be shown by the sword symbol already associated with campaigns for the control of cancer, superimposed upon the gravestone—symbol of death.

Graphic Message

No matter how difficult the process of designing the symbol, the result must be the same: that the graphic part of the finished chart carries the message and not the legend alone.

Of course charts using pictures have been made before. At some time you must have seen pictures of an enormous Russian soldier and a little American soldier with a caption that the Soviet Union has, let us say, ten times as many soldiers as the United States.

What was wrong? Two things, First the illustration is misleading; there are *more* Russian soldiers, *not bigger* ones!

Second, the method is bad from the graphic point of view because the eye cannot judge areas indicated within irregular shapes with any degree of correctness. You do not know what measure the artist has applied in making the figures. Did he increase the height, area or volume of the American ten times to get the size of the Russian?

The defects of these early pictorial representations lead to the second principle: to show changes in quantity by changing the *number* of symbols, not their size, area or volume.

The application of these two principles makes *Telefacts* easily understandable and statistically correct. They are also attractive and simple. These qualities stand together because they are the result of one and the same problem —elimination, in two different fields. Elimination of all unnecessary statistical detail makes the chart simple. And although elimination of non-essentials is listed third, it really is vitally important if a good chart is to be produced.

By re-introducing pictorial symbols, by making changes in quantity obvious and by simplifying its presentations, pictorial statistics become universally intelligible. Graphic presentations of facts, hitherto dodged by everybody desirous of appealing to a large audience, become desirable.

ECONOMICS

Increase of Taxes May Bring Communism Without Revolt

GRADUAL increase of taxes permits a nation to "approach communism at pleasure, always clinging formally to the principle of the right of private property," Dr. K.-G. Hagstroem, Swedish actuary, says in a report to the Econometric Society.

If the "Supported Party," consisting of those receiving dole, relief, pensions, "ham-and-eggs" and old age or unemployment benefits should reach a majority, it is entirely possible for them to impose taxes on the working part of the population that would plunge the country into a communistic state without any sort of revolution, bloodless or otherwise, he claims.

Exactly to what extent taxes may be increased without threatening democracy may be figured out mathematically by formulas presented by Dr. Hagstroem.

When the number of supported persons reaches 50 per cent. of the population, the limit where it becomes a majority, the danger point of taxation is at 30 per cent. of the excess of an individual's income above that minimum required for bare existence, Dr. Hagstroem has calculated.

Many countries are already in the neighborhood of this danger point of taxation, he said.

The danger can be removed, he declared, only by introducing into the constitution or Magna Charta of the country a proviso that a tax exceeding a certain proportion of the excess of a person's income above the minimum of consumption can not be imposed unless the deciding majority exceeds a certain fraction. The amount of this fraction takes into account the number of producing voters in the nation.

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ARCHAEOLOGY

Dura On The Euphrates Called Great Deposit of Ruins

RUINS of Dura-Europos on the Euphrates, where Yale University and French Academy archaeologists have industriously made the earth fly, are now an Eastern rival of Italy's famous ruined city of Pompeii.

This verdict of Prof. Michael Rostovtzeff of Yale, one of the scientific directors of the digging at Dura, is pronounced in a book just published, "Dura-Europos and Its Art" (Clarendon Press).

Dura rivals Pompeii, he declares, "in the number, importance, and state of preservation of the antiquities discovered there." But the resemblance is even more significant, in that Dura contributes to our understanding of happenings in Greek and Roman times.

Wonderfully preserved like Pompeii, whole sections of Dura lie almost intact where excavation has progressed. The archaeologists have unearthed a large number of homes of the Persian period, some palatial in style. They have dug out the garrison where the Roman dux, or leader, had an imposing residence for his staff, when the Romans took command of this Euphrates River fort-city. Twenty temples, where a great variety of ancient gods were worshipped have been unearthed, showing the religious trends in a city that had many kinds of people in its varied career.

Dura's people had as great a flair for painting pictures on their house walls as Pompeiians. They also indulged in scribbling amateur drawings and inscriptions on buildings. The scribblings illustrate all sides of life in the Near Eastern city.

In the palace of the Roman dux, pantomime dancers of the staff recorded their devotion to their master, the dux, says Prof. Rostovtzeff.

Along with worship of various gods, went a keen interest in astrology and magic, shared at Dura by Greeks, Semites and Roman soldiers.

"Horoscopes were frequently scratched on the walls of the houses," says the Yale archaeologist, "and magic figures and texts are as common as the horoscopes, both in the houses of the civil population and in the military buildings."

Evolution of Jewish religious art is made plainer at Dura, where a wonderfully preserved synagogue of the third century A. D. was painted with Old Testament scenes. In one picture of the sacrifice of Abraham, the human figures are shown only from behind and their heads are merely black spots, suggesting that rabbis at first were hestitant to depart from rigid interpretations of the passage in the Book of Exodus, forbidding the making of images.

The synagogue paintings have been skillfully transferred to the New Museum in Damascus, since they could not be saved for exhibit in their own place. Dura is not likely to become a tourist mecca on the Euphrates.

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ENGINEERING

Rifle Gives Man on Foot A Break Against Planes

THE NEW U. S. Army weapon, the Garand semi-automatic rifle, gives the man on foot a chance to hit back against hedge-hopping planes that fly low, to strafe him with machine-gun fire and light bombs. Such is the opinion of Frank J. Jervey, army ordnance engineer. (*Army Ordnance,* Nov.-Dec.)

The Garand takes a clip of eight cartridges at a loading, and can be fired just about as fast as a man can pull the trigger. Also, its recoil is very light, so that it can be held on the target far more steadily than the Springfield, standard infantry weapon for 35 years.

Because of slowness of fire and the necessity of throwing the sights off the target every time the bolt was operated to shove a fresh cartridge into the chamber, men on the march have had good reason to dread the ground-strafing plane; they have had practically no way of defending themselves. But as Mr. Jervey visions it, a company of soldiers now can turn the air above it into a veritable swarm of buzzing deadly hornets:

"An airplane traveling at a speed of about 200 miles an hour suddenly appears over the top of the trees. Within a split second, each man can bring his rifle to his shoulder and begin firing eight rounds almost as rapidly as he can pull the trigger. Defense of this type certainly should add materially to the protection of marching columns."

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ENGINEERING

Better Hurricanes Are New Trick of Motion Pictures

Modern Movie Storms Must Be Noiseless So as Not To Drown Conversation; Treadmills Also Silent

NEW tricks of the motion pictures were presented at the meeting of the Society of Motion Picture Engineers in Detroit.

A new type of silent wind machine, which will blow the blasts of a hurricane but keeps its noise level down so that speech recording is possible, was described by F. G. Albin of United Artists Studio Corporation.

The old type airplane propeller machines made so much noise, said Mr. Albin, that recording on the set was virtually impossible. The sound had to be recorded separately and then synchronized with the hurricane, sand storm or other scene. Moreover, the propellers blew over a wide area and could not easily be directed at a specific object or actor.

The new method utilizes a centrifugal air blower like those of ventilating systems. This blower is mounted outside the set and its blast of air directed inside by canvas ducts. The air comes in but not the noise.

Artificial Reverberation

Artificial reverberation is now being introduced into sound recordings in motion pictures, declared S. K. Wolf, of Acoustic Consultants, Inc., New York, and president of the Society.

Some sound studios, Mr. Wolf indicated, are so sound absorbing that the voices of actors may seem "dead" when played back. To introduce "liveness" into the sound record, reverberations are put in.

A magnetic tape type of recording is used to bring more realism into sound motion pictures. By passing the tape under a series of pick-up devices, and then leading the various pick-ups into a common mixing unit, it is possible to achieve a time lag and the desired reverberation. After passing the last pick-up unit the sound is "wiped off" the magnetic tape.

Silent Treadmill

The delicate microphones of sound motion pictures have required the development of silent treadmills, the much used devices which enable the motion picture camera to take pictures immediately in front of walking actors, oncoming horseback riders and so on.

In the old days of silent pictures, said J. E. Robbins of Paramount Pictures, treadmills were no problem. But the task of building treadmills, which will be silent so that sound recording can be done, while they are—at the same time—supporting about 20 marching soldiers, an automobile, or several motor cycles, is a difficulty which has only recently been overcome.

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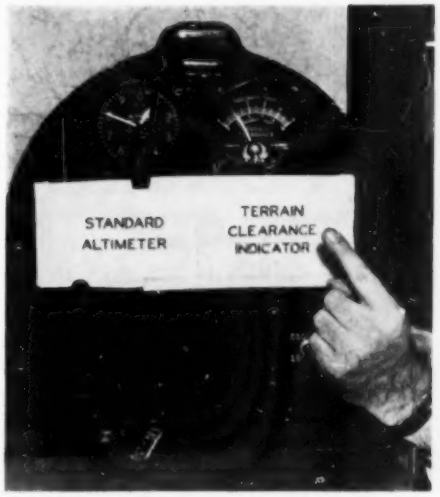

FINDS MOUNTAINS

This new life-saving device for the airplane pilot indicates, by means of a radio echo technique, the altitude of the plane above the ground instead of above sea level. (See SNL, Oct. 22)

ENGINEERING

Engineer Mixes Economics With His Technologic Work

TO SOME PEOPLE an engineer is the man who runs a railroad engine. And a civil engineer is an engineer who politely tips his hat to a lady.

Of a different sort are professional engineers who might be called applied scientists. They are of various varieties from the civils who build dams, bridges, buildings, roads and other structures, to the chemical kind who engineer the production of new kinds of substances out of raw materials.

The engineer differs from a scientist in that instead of creating new knowledge he applies known technology to the tasks that need to be done in our busy world. The engineer also mixes with his technology a bit of management, finance and organization. In fact, most engineers consider themselves within neither the ranks of capital nor labor, but units in an intermediate managerial class.

Just as engine operators are called engineers, some who perform merely technologic functions are also called engineers. The professional engineers feel that there should be a category of technologists for those unconcerned with economic aspects.

This question of names and definitions provides perennial discussion. Latest description of an engineer is by President Karl T. Compton of Massachusetts Institute of Technology in collaboration with a committee of the Engineers' Council for Professional Development:

"An engineer is one who, through application of his knowledge of mathematics, the physical and biological sciences, and economics, and with aid, further, from results obtained through observation, experiences, scientific discovery, and invention, so utilizes the materials and directs the forces of nature that they are made to operate to the benefit of society. An engineer differs from the technologist in that he must concern himself with the organizational, economic, and managerial aspects as well as the technical aspects of his work."

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GEOGRAPHY

Polar Bibliography Now Being Compiled

THE FIRST bibliography of works dealing with the Polar regions to be prepared in 60 years has been compiled by the Works Progress Administration working with the Explorers Club.

Listing in the first section, already published, more than 450 titles as against the 50 titles the Library of Congress was able to supply, the list includes all references from books, government documents and periodicals.

Vilhjalmar Stefansson, noted polar explorer and chairman of the club's section on polar exploration, and Leonard Outhwaite, chairman of the committee on bibliography, guided the project.

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PHYSICS

Photographic Eye Denied As Myth by Physicist

THE "photographic eye," capable of reading an entire page of print at a glance, is a myth.

Eye movement photographs of subjects taken while they were reading did not reveal a single person with such a magical eye, Dr. J. F. Neumueller, director of the American Optical Company's bureau of visual science, has learned.

Only one reader with a reading span of six to eight words per glance was found, Dr. Neumueller declared. The average reader of the college level had a span of 1.25 words. However, the average person, the scientist stated, does not use his maximum reading glance.

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BIOLOGY

New Facts Learned About Nitrogen Capture by Plants

PERHAPS the one fact about agricultural biology that practically everybody knows best is that plants of the legume family (peas, clovers, locust trees, etc.) make possible the capture of free nitrogen from the air and its conversion into useful fertilizer in the soil. The primary role of the bacteria that live in the little lumps or nodules on their roots is part of the instruction of every school child nowadays.

Yet there have remained large blank spaces in scientists' knowledge of this process, vitally important to everyone who eats beans or peas, or the milk and meat of cattle that have eaten alfalfa or clover. We have known for a good many years that the process goes on, but a lot remains to be learned about *how* it goes on.

Some considerable strides forward are shown in a newly published little book, written by Prof. Artturi I. Virtanen of the University of Helsinki, Finland (*Cattle Fodder and Human Nutrition*, Cambridge University Press). Prof. Virtanen has long been known among scientists for his researches on the nitrogen-fixing bacteria.

Hitherto it has been rather generally assumed that since plants in general like their nitrogen in inorganic form, the bacteria in the legume root nodules must present their hosts with the fixed product in the form of ammonia. Prof. Virtanen has shown this assumption to be erroneous: the bacteria turn out quantities of aspartic acid, and the plants are able to take this acid directly into their systems and make use of it.

Aspartic acid is one of the amino acids, which are the building-blocks of proteids, and through them of living protoplasm. Aspartic acid has also been found in quantity outside the roots, in the soil near the nodules; the bacteria are lavish producers.

If the bacteria thus benefit the plants whose roots shelter them, they in their turn are dependent on the plants. Although pure cultures of them can be grown outside the plants, they apparently are able to capture atmospheric nitrogen and convert it into usable form only when they are surrounded by legume tissue and bathed in legume sap.

Science News Letter, November 12, 1938

PSYCHOLOGY

Take Parents to Task For Child's Misdeeds

PARENTS, these days, are being taken to task for their children's delinquencies, which may range from ordinary "bad behavior" to crime and drug addiction. Mental disorders, too, are blamed on the parents' attitude.

Parents who show great affection for their children, pet them and look after them and worry over them, are unconsciously hiding a hostile feeling toward the child which is the result of the parents' own inner feeling of bitterness about the world in general. The result of the excessive love and care for the child is to make him his parents' slave. When he grows up he cannot become independent. He is either too submissive for his own good, or he takes the attitude of showing parents and other authorities "where they can get off." And he is likely to end up a good-for-nothing, a gambler, or worse, a drug or alcohol addict or a criminal.

This explanation of parental attitudes is given by Dr. Gregory Zilboorg of New York. Another New York psychiatrist, Dr. Margaret E. Fries, traces the child's behavior to the parents' feelings before the child is born. Infants ten days old, she reported, show fundamental differences in behavior. Some of this may be due to injury at birth or a prolonged birth period. Some of it is due to the hidden and perhaps unconscious feeling of parents. The very way a mother holds her baby, Dr. Fries finds, shows how she feels about the infant. The baby himself senses this attitude, Dr. Fries believes, and responds accordingly.

Science News Letter, November 12, 1938

IN SCIENCE

INVENTION

Machine Gun Pistol Patented in United States

A MACHINE gun pistol, whose spiral cartridge magazine resembles somewhat the coils of caps found in the ordinary cap pistol, has been patented by Herman J. Kobe of Bryan, Ohio.

Capable, in the version described in detail in the patent, of holding 50 cartridges, the gun may be fired as an automatic, emptying the magazine by a single pull of the trigger, or may be fired a shell at a time.

The cartridges are arranged in the spiral holder crosswise to the gun. As the pistol is fired and the empty cartridge ejected, the next bullet moves into place in the breech, impelled by a spring arrangement in the center of the spiral magazine. The bullets are turned as they move into firing position so that the lead points forward in the direction of fire.

The magazine is no wider than the pistol, thus adapting it to be carried in a holster. The magazine is located in front of the trigger and trigger guard and is not much larger. Light weight and freedom from jamming are claimed by the inventor. The patent, No. 2,130,722, is assigned to Lisle M. Weaver, also of Bryan.

Science News Letter, November 12, 1938

RADIO

New Television Receiver Kit Costs Less Than $100

MARKING another step on the long road to television as a practical reality, a television receiver constructing kit whose total cost is under $100 has been placed on sale by a New York radio equipment manufacturer. The set provides 441-line reception, designed for the type of program now being broadcast by the National Broadcasting Company from the Empire State Building and soon to be sent out by Columbia Broadcasting System from the top of the Chrysler Building.

The set uses 15 tubes, which are included in the kit. The image is produced in a five-inch cathode ray tube. The set is one of the cheapest thus far placed on the market.

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...CE FIELDS

CHEMISTRY

Sugar Solution Is Used In Freezing of Fruit

DELICATE quick-frozen strawberries, that rival the fresh fruit in their taste and texture when defrosted and served, are now being preserved by chilling them in cold sugar syrup.

In a report to the Food Preservation Conference, sponsored by the University of Tennessee and the American Society of Refrigerating Engineers, R. Brooks Taylor of the University's Engineering Experiment Station described the improved freezing process.

Merit of the method, Mr. Taylor indicated, is that the individual fruit is frozen at a temperature a little above zero degrees Fahrenheit instead of at severe temperatures used in some other methods. The freezing agent is sugar solution kept cold by cooling coils in the freezing container.

Over 200,000 pounds of fruit have now been frozen with excellent results. Only six minutes is required for the treatment.

Science News Letter, November 12, 1938

ARCHAEOLOGY

Many Building Inventions Credited to Old Egypt

EGYPT or Mesopotamia—which was first to invent familiar features of architectural construction?

There's a question not yet positively answered. Expeditions keep finding evidence to revise our ideas of how old architectural devices really are. Only one point is very clear: city dwellers of early time lived much better than we have supposed, and they were not backward at inventing architectural improvements.

Recently, Mesopotamia has been getting the limelight, with the discoveries in 22 layers of ruins at Tepe Gawra. They show that architecture was already a fine art in 4000 B.C. An architectural gem of a temple was built by men who knew how to construct piers and pilasters—which we had previously thought inventions of the Middle Ages.

The layer of Tepe Gawra-8, which was a city of about 3500 B.C., was laid out by plan and its better homes had windows, and such pleasing features as vaulted ante-chambers, recessed walls and niches.

But Egypt is not being left out. In a new and remarkably complete work on "Egyptian Architecture as Cultural Expression" Prof. E. Baldwin Smith, Princeton's professor of the history of architecture, gives Egypt credit for many inventions.

Egyptians were first to use ventilators for cooling their houses, he says. Egyptians gave the Greeks the idea for lion-headed water spouts. They dug crypts under their temples, a device which Christians adopted.

Prof. Smith also credits Egypt with having the earliest known vertical city houses. They worked upward in evolving houses of several stories, by first using the roof of a one-story house for a cool retreat, then enclosing it to make a second story.

They were first to have town-planning on the regular grid arrangement. And Prof. Smith says: "Undoubtedly their masonry construction was the first in the history of man."

He mentions a good many other Egyptian "firsts"—piling up the debt we owe to the Nile civilization, for all these features are familiar in the most modern city.

Science News Letter, November 12, 1938

INVENTION

New Telegraph Typewriters Permit Direct Sending

USING a new, simple printing telegraph system, newspaper reporters at a news event can now sit at their own typewriters and send their stories directly back into their home city rooms.

Devised by W. G. H. Finch, expert on radio and wire facsimile, the new device utilizes ordinary telephone wires to carry the typed message and feeds its signals by electrical induction in to the wire without touching them.

Special merit claimed for the new method is that the cost of transmission is based only on the time the telephone line is actually used with the tolls comparable to an equivalent local or long distance telephone call.

A special typewriter keyboard is carried by the reporter to the assignment and he can operate from the nearest telephone. Mr. Finch, formerly assistant chief engineer of the Federal Communications Commission, has just received patent No. 2,133,811 covering the new system.

Science News Letter, November 12, 1938

STANDARDS

Standards Bureau Issues Gold Marking Standard

A NEW voluntary standard for marking gold jewelry that provides that every quality mark shall be accompanied by a registered trade mark to fix responsibility has been issued by the National Bureau of Standards in cooperation with jewelry trade associations.

Formulated at public hearings at which the tolerances of the national stamping Act of 1906 were scored as being too "liberal" and as allowing some manufacturers to take advantage of the marking allowances of the law to sell below-grade goods, the standard goes into effect on new production on Nov. 25. An additional year is allowed for clearance of existing retail stocks.

Ten-karat gold is the minimum on which a quality mark should be permitted, it was decided at the hearings.

Science News Letter, November 12, 1938

ARCHAEOLOGY

Unearth New Puzzle In American Prehistory

DISCOVERY of American flint tools surprisingly like handiwork of Europe's Stone Age cave men is announced by Dr. A. R. Kelly, who has been excavating Indian ruins in the neighborhood of Macon, Georgia.

In a report to the Smithsonian Institution, Dr. Kelly says that several thousand knives, scrapers, projectiles and other flint implements belonging to unknown prehistoric people have been found.

Cautiously refusing to assign a date to the prehistoric hunters, Dr. Kelly says their work may appear deceptively ancient. He does state that they go back to a time before pottery making was known in the Southeast, which argues for quite lengthy antiquity. The flints are worn by weathering to suggest great age, though they may have decomposed with unusual rapidity in their surroundings. Also, many have a look of the famous Folsom technique, which marked the handiwork of America's mammoth and bison hunters near the end of the Ice Age. One projectile he describes as truly Folsom, indistinguishable from Folsom points found in the east, though different from the western type.

The workmanship is described as resembling artifacts of the middle and late Old Stone Ages in Europe.

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PSYCHOLOGY

Nursery Nazis

Stern American Parents Are Training Totalitarians, Is Charge; Lack of Restraint Makes Anarchists

By DR. FRANK THONE

NURSERY Nazis!

No, that hasn't anything to do with this business in Europe, of drilling five-year-old kids with wooden guns, and teaching them to click their heels and give the stiff-arm salute. It's going on right here in America, right in the bosoms of many of our best families.

Proud parents, who have the orthodox American scorn for the ways of foreign dictatorships, are nevertheless unconsciously making their own offspring into goose-stepping little Fascists, and also instilling in the young minds of some of them the will to become Duces and Führers, some day. If there are dangers to democracy in this country, many of them are now running about in play-suits. For these, "der Tag" is still 15 or 20 years in the offing.

How typical, well-disciplined American family life can breed a fascistic mental attitude, even in very young children, is disclosed by Dr. O. H. Mowrer of Yale University. In his work at the university's Institute of Human Relations, Dr. Mowrer has to deal with several types of "problem" children, and it was among them that he found his little incipient Fascists.

Problem children are, nine times out of ten, living records of parental mistakes. The great majority of them can be roughly separated into two divisions. There are the children who have grown up without any effective parental restraint or discipline. These are the spoiled brats, the little anarchists. Then there are the poor kids who have had an overdose of home discipline, and that frequently of an overbearing and arbitrary sort. These become the nursery Nazis.

Although the spoiled-brat variety is the kind that usually attract most attention (possibly because of their sheer obstreperousness) Dr. Mowrer finds them less difficult to deal with than he does the over-disciplined young unfortunates. He says:

"With one class of children, namely those whose difficulties have arisen because of the laxity and inconsistency of their previous training, the problem is not particularly acute; objectionable behavior can usually be eliminated in their case by the simple expedient of providing an appropriate system of rewards and penalties which is held in force with sufficient firmness and constancy to bring about the desired revision of habitual ways of feeling and acting."

But if the psychologist finds the civilizing of brats not especially difficult, he has a far harder time with the poor kids who have been "sat on" all their lives, by authoritarian parents and teachers. They are the unfortunates who have grown up in homes where the mid-Victorian motto still prevails: "Children should be seen and not heard;" where the parental attitude is: "Minnie, find out what Willie is doing and tell him to stop it!"

Parents and teachers of this type would be astonished and indignant if they were accused of being egoistic tyrants. It seems only the normal thing to them that adults should demand and get obedience, instant and unquestioning, from the children subject to them. Many of them are apt to inflict harsh punishment for the least infraction or challenge of their rule, not because the child's act was bad in itself, but because it constituted the even graver sin of disobedience.

Bosses or Sheep

Effects of such parental or pedagogical autocracy on the minds of children subjected to its unremitting pressure are likely to be devastating, and to last through the adult lives of the victims. They will either become docile automatons, responding readily to any assertion of outside authority and never maturing to the point of accepting responsibility for their own lives, or, after years of secret inner rebellion, they will themselves become self-asserting bosses of the mass. They may rise to the top as Führers and Duces, or accept intermediate positions in an authoritarian set-up, blindly accepting orders from above and as blindly exacting obedience as they

NOT DESTRUCTIVE NOW

Too interested in their painting to look around at the camera are these "problem children." The little boys were very destructive with ready-made toys and when first given packing boxes to play with they only tore them apart. But when they were permitted to paint the boxes themselves, they took pride in their workmanship and learned real respect for property.

transmit them to their cohorts beneath.

Says Dr. Mowrer:

"If the modern democratic forms of government have not been found to function as efficiently and smoothly as might have been wished, at least some of the difficulty may reasonably be sought in the distinctly undemocratic regime under which the average individual lives for the first two decades of his life.

"Children seem to react to the autocratic atmosphere of home and school either by a surrender of individuality and a life-long seeking after and dependence upon so-called 'leaders', however demagogic, or by identifying themselves with this system and struggling by means foul or fair, to become 'leaders' themselves. This state of affairs is not conducive to the success of a democratic state.

Father Substitutes

"As various writers have pointed out, kings and dictators gain much of their popular appeal by virtue of the role they play as father-substitutes for the grown-up children who are their subjects. Modern fascism springs from psychological roots which are as old as the human family and which are by no means confined to the populace of those countries in which fascism has gained official status.

"The danger of emergence and growth of such a political doctrine, with its emphasis upon subservience and blind submission to the principle of leadership, comes, not from propaganda and pressure from outside, but from a country's own internal educational and economic institutions.

"No one, I believe, can at present point with certainty to the solution of this important problem; but surely encouragement of greater independence and emotional self-sufficiency in children and practice in the resolution of their social difficulties by democratic techniques is a step in the right direction."

Desirable though the move toward solution suggested by Dr. Mowrer might be, it took considerable faith and courage to put it into actual operation with real, live problem children. For in plain and simple terms it meant taking a batch of these long-repressed youngsters, loosening up all the "don'ts, and leaving them pretty much to themselves to take the consequences of their own acts.

In practice, of course, they weren't left to complete anarchy, but their supervisors really did heroically restrain impulses to set things right, so long as the kids

kept clear of total wreck. And in the end this heroic experiment in democracy justified itself.

After a sufficient period of experience in wrestling with their own problems, the children quite generally approved self-government system. What opposition there was came mostly from adult outsiders. Dr. Mowrer answers these critics with the suggestion that those who disapprove democratic self-government for children are akin to those who in every society "strive to achieve or maintain positions of power and special privilege by promoting servility on the part of the masses."

The first thing that had to be done with the group of over-repressed children with whom Dr. Mowrer worked was to let them learn for themselves the difference between "don'ts" that are arbitrary and meaningless, and "don'ts" that really mean something—that are warning signs on the road to trouble.

The 24 members of the group, ranging in age from four to twelve years, were called together. It was explained to them that in the future they might meet, with the adults who were taking care of them, whenever it seemed necessary. They were to deal for themselves with whatever problems might arise.

Utilitarian Morals

The idea of social morality was put on utilitarian basis. It was pointed out that stealing, for example, was objectionable not simply because grownups might say it was "wrong" but because if one child could "get away with it" presently there would be no safety for the belongings of anyone. Similar utilitarian values were explained for telling the truth, keeping clean, and so on.

Naturally, the kids were not expected to take the grownups' word for all this. They were left to learn from experience the practical truth behind the precepts.

On one occasion, four or five small boys thoughtlessly broke out some window screens on a play-porch. Their offense was brought before a meeting of the group, and the culprits were told that they had to earn the money to pay for the damage they had done. This of course took time, and during the interim the screens were left just as they were. The whole group were bothered enough by flies and mosquitoes so that they had the lesson of respect for community property firmly fixed in their minds.

"A few such empirical lessons made the restraints essential for harmonious cottage life take on a reasonableness which could have scarcely been achieved through arbitrary adult enforcement," comments Dr. Mowrer.

The whole experiment came out better than anyone had expected, he states: "Some of the advantages which accrued from this new regime had, of course, been anticipated but others had not.

"As enforcement of the necessary regulations and prohibitions was taken over more and more by the group itself, the staff members ceased to be regarded primarily as disciplinarians, who were to be outwitted, harassed, or placated, as the occasion might demand; and the total number of infractions which had to be dealt with decreased at a remarkable rate. The children became much freer in their relationships with the adults, able to share their phantasies and to speak about matters which, because of previous anxieties or resentments, would have been impossible to discuss.

"Soon the cottage meetings also came to be used as occasions for reporting commendable as well as objectionable behavior, and an additional motive for good behavior, in the form of a desire for group praise, was thus added to the already existing influence of group disapproval.

"In the beginning it was found that the children were inclined to be more severe with each other than an adult would have ordinarily been under similar conditions. Since the meetings are always conducted under the supervision of representatives of the staff, over-severe punishment could always be toned down to be in keeping with the offense. This placed the adults in the strategic position of being able to befriend and protect the offender instead of having to be aligned against him."

Be it remembered, too, that this group of children started from away behind scratch. They came to Dr. Mowrer a badgered lot of embryo Fascists. They learned democracy by practicing it, by applying its methods toward the solution of their own problems. In this small-scale test, therefore, there would seem to be justification for Jefferson's dictum: "The cure for the ills of democracy is more democracy."

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PHYSICS

Radioactive Grease On Metals Will Detect Surface Flaws

SPECIAL greases that give off piercing radiation are now being used by scientists to detect flaws in metals, it was reported to the American Society for Metals by Herman F. Kaiser of the staff of the U. S. Naval Research Laboratory, Washington, D. C.

The Navy already uses piercing rays from radioactive materials to see inside heavy armor plate and spot flaws. The newer method, if it works out successfully, would supplement this practice by bringing out tiny surface flaws which might escape attention.

In the tests, Mr. Kaiser indicated, compounds of thorium, which are weakly radioactive and liberate radiation, are mixed with amber petrolatum. This material is smeared over the metal under study. The coated metal is then placed in a chamber where the grease is forced into any crack by a pressure of 1,000 pounds to the square inch.

Next, the surface is cleaned with alcohol to leave only the grease which has penetrated into cracks. The metal is then carefully wrapped in photographic sensitive paper and stored away for a week.

On development of the negative, those portions over a crack containing the grease show up as dark streaks on a white background.

The method is reminiscent of the original discovery of X-rays by Roentgen, who found that light-shielded photographic plates were exposed by X-radiation.

The method, too, resembles a common rough test used by geologists to test a piece of ore for possible content of radioactive material.

Much work on the technique will probably be needed before it can go into standard use, Mr. Kaiser pointed out, but "the possibilities offered by the natural radioactive elements are found to be quite promising."

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Within three years 448 Wisconsin beavers have had compulsory moving days to keep them from building dams where they would cause destructive floods.

CHEMISTRY

Chemists Find Way To Use Low Grade Italian Bauxite

Treatment With Excess Sulfur at High Temperatures Makes Formerly Worthless Ore a Source of Aluminum

A WAY has been discovered in Columbia University's electro-chemical laboratory to use low-grade bauxite ore from Italy as a valuable source of aluminum.

The discovery potentially breaks the semi-monopoly of the few sources of commercially acceptable high-grade bauxite ore. This bauxite ore has been a highly important "strategic" mineral in the maneuvering of nations for economic supremacy. It is vital in time of war.

In a report to the Electrochemical Society, Prof. Colin G. Fink of Columbia and graduate student V. S. de Marchi describe their new method of removing the excessive amount of iron oxide from low-grade Italian bauxite and producing, on a practical scale, a residue which will yield shining aluminum.

Bauxite is the name of rock containing hydrated alumina mixed with various oxides. White bauxite, very rare, is rich in alumina and low in iron oxide. It is used in ceramics and in the production of artificial gems. Red bauxite, more widely distributed, is used in the production of aluminum.

Ferruginous bauxite, very abundantly distributed in nature, contains so much iron oxide that it is not commercially used at present.

It is with this third type of bauxite that Prof. Fink and Mr. de Marchi worked. Their aim was to discover a way to remove most of the iron oxide and make possible the use of the once valueless ore as a source of commercial aluminum. Moreover, they sought to refine red bauxite and bring it into the class of the rare, white bauxite.

Chemically the steps in the new process consist of treating bauxites with high iron content with an excess of sulfur at high temperatures. By this treatment the iron oxide is converted into iron sulfide. The excess sulfur that does not react is boiled off.

Along with the change of iron oxide into iron sulfide the presence of sulfur changes over the other impurities present, titania and silica, into their sulfur compounds.

These sulfides are then treated with an excess of chlorine and aluminum chloride results. "The chlorination of the sulfided Istrian (Italy) bauxite at 600 degrees Centigrade, removes 90 per cent. of the iron oxide, over 50 per cent. of the titanium dioxide and 14 per cent. of the silica," report the scientists. "The alumina losses were only 9 per cent. The reaction is complete within the first five minutes of chlorination.

"If the chlorination . . . . . is carried out at 920 degrees Centigrade, 94 per cent. of the iron oxide, and 66 per cent. of the titanium oxide are removed. The alumina losses are only 7 per cent."

Whether the cost of the treatment of the high iron content bauxite will be low enough to permit commercial production at a peacetime price is still undetermined. But one can be sure that in event of war, where price is no object, the method probably would be used, not only in Italy but in many other nations which lack red bauxite deposits but do possess the now valueless ferruginous bauxites.

Science News Letter, November 12, 1938

PHYSICS

Piano Tuning Circles Puzzle Over New System

MOST OF US, whether we can now play the piano or not, can remember the thumping of the piano tuner as he worked his way back and forth over the instrument.

How beautiful chords and tones finally came out of the piano after the job was done, probably still lingers in most folks' minds as one of the minor miracles.

As a highly specialized art and science, piano tuning has reached a stage where new methods are rare and the methods are stabilized into a fairly classical pattern of tuning by fourths and fifths.

Right now things are mildly teeming in piano tuning circles for from France has come a new method of tuning by tenths. This new method appeared in a report by Jean de Bremaeker in Musique et Instruments. *The Journal of the Acoustical Society* of America has just published an abstract in English.

Like all methods of piano tuning, the Bremaeker method achieves its results by putting the piano out of tune and then gradually comparing beat notes until correct register of tone is accomplished.

But the new method does this by spreading the work out over about a third of the piano keyboard while the current methods utilize only a single octave, if possible, for this original "laying the bearings" as the piano tuners call it.

A claim for the Bremaeker system is that all octaves are true octaves and not distorted as in current methods. Mr. Bremaeker insists that the "stretching" of octaves in the upper and lower registers is a "barbarous practice" whereby brilliant music is obtained at the expense of pathetic.

William Braid White, acoustical consultant of Chicago, and Doctor of Music has tried out the new method and informs Science Service that it is in no way better suited to give results more accurate than are reached by the best of American tuners. With this lack of superiority comes a great increase in the complexity of an already complex job.

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PHYSICS

Scientists Seek to Simplify World's 2,000 Color Names

SCIENCE is nearing the end of its task of trying to set up a few simple names for colors which will bring order out of the more than 2,000 designations which colors now have.

In a report to the Optical Society of America, Dr. Deane B. Judd, of the National Bureau of Standards, disclosed that only a few revisions remain in the task of finding 320 designations for all colors.

Actually only a few names are needed in the system devised by the Inter-Society Color Council. Eight adjectives—strong and weak, light and dark, and pale, deep, dusky and brilliant—are applied to each hue name to make up the total of 320.

The agreed upon names are: pink, red, orange-pink, red-orange, red-brown, orange, brown, yellow-orange, yellow-brown, yellow, olive-brown, olive, yellow-green, green-olive, green, blue-green, blue, purple-blue, purple, purple-pink, red-purple. And in addition, white, grey and black.

The scientific classification of colors, Dr. Judd said, was undertaken at the request of the American Pharmaceutical Association to simplify the color designation of drugs and chemicals.

In its broadest aspects the new system of simplified colors could be applied to all fields of activity where colors are used.

However, scientists realize that manufacturers might be averse to putting out a color known as a "weak" pink or a "weak" blue, even if it is scientifically accurate. Thus Twilight Mauve, Titian Tan, Patio Blue and the other new fall shades will probably be around for awhile.

Artificial Daylight Studied

A two-year study on artificial illumination in the color grading of cotton and other farm produce, shows that the extreme intense light previously suggested is not necessary.

Ninety footcandles has been the minimum illumination recommended. But checks at the various stations of the U. S. Department of Agriculture show that 45 footcandles is sufficient in most cases, reported Dorothy Nickerson of the U. S. Bureau of Agricultural Economics. Only on dark overcast days in December was an illumination of more than 100 footcandles required.

The search for proper standards for artificial daylight was described in another paper by Dr. Deane B. Judd of the National Bureau of Standards. A correct light simulating daylight must preserve color differences.

That is, if one of two samples appears just noticeably redder than the other in daylight it should also appear just noticeably redder under the artificial rays.

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When the Menai Bridge was built in Wales over 100 years ago, it was a wonder of its age; now it is being reconstructed for heavy traffic.

● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the Jesuit Seismological Association resulted in the location of the following preliminary epicenter:

Saturday, Nov. 5, 5:43.3 p. m., Japan Time.

On Japanese coast, about 150 miles northeast of Tokyo. Latitude 38 degrees north, longitude 140.7 degrees east.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL August 13.

CONSERVATION

NATURE RAMBLINGS by Frank Thone

African Game Protected

DISAPPOINTMENT lies in wait for over-enthusiastic sportsmen who may be induced to go down to South Africa (where it's summer now) with the expectation of shooting a nice mess of hippos or a few giraffes. They just won't get 'em; South African game laws rigidly prohibit their shooting and put strict limitations on the taking of many other kinds of game.

A letter received by Science Service from J. W. H. Wilson, secretary of the Wild Life Protection Society of South Africa, warns against glowing accounts of supersport in that glamorous land that have somehow got into circulation. Hunting is possible there, good hunting, but only under such restrictions as obtain in any civilized country.

Mr. Wilson's letter follows:

"My attention has recently been drawn to more than one attempt, by advertisement and otherwise, to entice overseas sportsmen to the Union of South Africa with promises of facilities for big and small game hunting.

"These promises are couched in language that is unjustifiably optimistic, not to say misleading.

"There is still much good hunting to be had in many parts of South Africa but mostly on privately owned farms where in many cases game is carefully preserved.

"Speaking generally, game is to a great extent strictly protected by law throughout South Africa, particularly in the Transvaal, and permits for shooting certain species of game are only granted in those districts where those particular species are fairly numerous.

"Roan Antelope are being strictly protected everywhere. Only in special circumstances will permits be issued for shooting Oribi, Reed Buck and Sable Antelope. Permits to shoot Wildebeest, Zebra, Kudu, Impala and Waterbuck are only issued in those districts where these animals are sufficiently plentiful. Permits to shoot Elephant, Hippo, Rhino and Giraffe are not to be obtained.

"Even a farm of 10,000 acres well stocked with game might easily be deserted by game, other than birds, after a week or two of intensive shooting. Disappointment is bound to be the lot of many who come to South Africa on the strength of such promises.

"Sportsmen who propose visiting South Africa in the hope of getting some big or small game hunting will be well advised to make the closest enquiries before concluding arrangements with persons offering hunting facilities.

"My Society is prepared to give advice on game to any one who desires to visit the Union of South Africa on a shooting trip."

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BIOLOGY—CHEMISTRY

Chemists Making Keys To Fit Nature's Locks

SCIENTISTS working at the chemistry of living bodies, called biochemistry, are in a sense locksmiths.

One group of physiological locksmiths are searching for Nature's keys. These are the scientists who are isolating chemicals manufactured in the body, hormones for example, determining their chemical structure and rebuilding them in the laboratory from the original materials used by the body.

Another group, as recently pointed out in the British scientific publication, *Nature*, are trying to make skeleton keys to open Nature's locks. These scientists are concerned with the synthesis or building of simple chemical compounds which will have the same effects as natural hormones and vitamins.

An example of this search for the skeleton keys appears in recent work on the synthesis of the female sex hormones. In the course of following a scheme to simplify the chemical structure of the molecule of the female sex hormone, scientists have obtained substances with an activity which far outstrips that of the natural hormone. One of these compounds, stilboestrol, is about ten times as powerful as oestrone.

The structure of this powerful synthetic compound does not seem to be at all like that of the natural hormone, but in theory, at least, the synthetic substance could be changed by a little easy chemical manipulation into a substance having the same skeleton framework as the natural hormone.

Stilboestrol, therefore, and related artificial hormone-like substances, appear to be skeleton keys. If they really can go so far in imitation of natural hormones as to open some locks they may prove valuable aids to medicine.

Science News Letter, November 12, 1938

ZOOLOGY

U. S. A. a "Safety Island" For Important Animals

SHOULD Uncle Sam tell his gold ingots, stowed safely at Fort Knox in Kentucky, to move over a bit and make room for specially bred rats and mice and fruitflies and other biologically important lines of animal life that might be blotted out in European air raids?

Germ of such a possibility is seen in the arrival in this country of breeding stocks sent from England when war seemed imminent. One scientist, who sent some valuable rats to Prof. Leslie C. Dunn at Columbia University, pointed out that since his laboratory was near a big railway terminal, a bomb aimed at the terminal might hit the laboratory and thus destroy in a second the genetical work of years. So he wanted his precious rodents to be in a safe place.

Science News Letter, November 12, 1938

•First Glances at New Books

Population

NEEDED POPULATION RESEARCH—P. K. Whelpton—*Science Press,* 196 p., $1. The author says; "Before the clamor of special groups in this country leads to further legislative action affecting the number and kind of people, it is earnestly to be hoped that the scientists conducting population research may be able to provide a more substantial foundation of facts on which a sound policy may be built." Here is a suggestive outline of what is needed.

Science News Letter, November 12, 1938

Biology

BIOLOGY—Truman J. Moon and Paul B. Mann—*Holt,* 986 p., illus., $2. Really a lot of high school textbook for your money; and it looks like good quality, too. The authors aren't afraid of occasional literary touches and colloquialisms, and this adds to the liveliness of the book.

Science News Letter, November 12, 1938

Biology

CATTLE FODDER AND HUMAN NUTRITION WITH SPECIAL REFERENCE TO BIOLOGICAL NITROGEN FIXATION—Artturi I. Virtanen—*Cambridge (Macmillan),* 109 p., $2.50. See page 312.

Science News Letter, November 12, 1938

Biography—Juvenile

WIZARD OF THE WIRES: A BOY'S LIFE OF SAMUEL F. B. MORSE—Helen Nicolay—*Appleton,* 326 p., $2.50. This book, claimed to be the first boy's biography of the inventor of wireless telegraphy, catches the spirit of perseverance without which this invention would not have received its early acceptance.

Science News Letter, November 12, 1938

Physics

ATOMIC STRUCTURE—Leonard B. Loeb—*Wiley,* 446 p., $4.50. An undergraduate text designed for use in engineering and other colleges where physics is a two-year comprehensive course.

Science News Letter, November 12, 1938

Engineering

PROBLEMS ON APPLIED THERMODYNAMICS—Virgil Moring Faires and Alexander V. Brewer—*Macmillan,* 137 p., $1.40.

Science News Letter, November 12, 1938

Biography

FROM CAPTIVITY TO FAME, OR THE LIFE OF GEORGE WASHINGTON CARVER (New ed.)—Raleigh H. Merritt—*Meador,* 230 p., $2. Biography of the well known Negro chemist whose life-long researches have done so much to find uses for peanuts and other southern farm products. Recipes for 105 different ways of preparing peanuts for table use are contained in the appendix.

Science News Letter, November 12, 1938

Zoology

TEXTBOOK OF GENERAL ZOOLOGY (3d ed.)—Winterton C. Curtis and Mary J. Guthrie—*Wiley,* 682 p., $3.75. In this new edition, there has been some rearrangement of contents to make for a more logical and effective teaching order, together of course with inclusion of new developments in zoology since the appearance of the second edition five years ago.

Science News Letter, November 12, 1938

Photography

AMATEUR MOVIE PRODUCTION (2nd ed.)—William J. Shannon—*Moorfield & Shannon,* 64 p., 50 c. A pocketsize handbook for those who wish to make their own movie dramas.

Science News Letter, November 12, 1938

Psychology—Sociology

THE GOOD HOUSEKEEPING MARRIAGE BOOK—William F. Bigelow, ed.—*Prentice-Hall,* 173 p., $1.96. A series of articles by prominent persons which was inspired when the editor of Good Housekeeping read that students in a California university had asked for a course in marriage relations.

Science News Letter, November 12, 1938

Mathematics

LES NOUVELLES MÉTHODES DE LA THÉORIE DU POTENTIEL ET LE PROBLÈME GÉNÉRALISÉ DE DIRICHLET—C. de La Vallee Poussin—*Hermann & Cie, Paris, France,* 47 p., 15 fr.

Science News Letter, November 12, 1938

Entomology

HISTORY OF AMERICAN BEEKEEPING—Frank C. Pellett—*Collegiate,* 213 p., $2.50. Apiarists, and economic entomologists generally, will be interested in this book. It takes up the history of beekeeping from a dozen different angles, treating not only the development of hives, frames and handling apparatus, but also journals and books, biographies of noted beekeepers, bee plants, diseases, etc.

Science News Letter, November 12, 1938

Archaeology

DURA-EUROPOS AND ITS ART—M. Rostovtzeff—*Oxford Univ. Press,* 162 p., 12 text figures, 28 plates, $5. See page 310.

Science News Letter, November 12, 1938

Aeronautics

LISTEN! THE WIND—Anne Morrow Lindbergh—*Harcourt,* 275 p., $2.50. The story of the Lindberghs' survey flight around the North Atlantic in 1933—a period when planes were not quite so good and flyers were a little closer the elements than they are today or will ever be again, thank goodness!

Science News Letter, November 12, 1938

Anthropology

ANTHROPOLOGICAL PAPERS—Bureau of American Ethnology—*Govt. Print. Off.,* 204 p., 40 c. Six miscellaneous papers, including Dr. Kelly's preliminary report on discoveries at Macon, Georgia, and a paper on "what remains of the Carib language and culture" by Douglas Taylor. The bulletin inaugurates a new series by the Bureau, intended as an outlet for brief articles.

Science News Letter, November 12, 1938

Archaeology—Architecture

EGYPTIAN ARCHITECTURE AS CULTURAL EXPRESSION—E. Baldwin Smith—*Appleton-Century,* 264 p., ill. in pen and ink by the author, $6. See page 313.

Science News Letter, November 12, 1938

Chemistry

READINGS IN ELEMENTARY ORGANIC CHEMISTRY—L. A. Goldblatt, ed.—*Appleton-Century,* 150 p., $1.25. Reprints of outstanding summarizing articles on organic chemistry which will supplement a college course in this subject.

Science News Letter, November 12, 1938

Physics

FUNDAMENTALS OF ELECTRICITY AND MAGNETISM (2d. ed.)—Leonard B. Loeb—*Wiley,* 554 p., $4. A comprehensive undergraduate text designed for those universities where physics is covered thoroughly in a two-year course.

Science News Letter, November 12, 1938

Psychology

GUIDING HUMAN MISFITS—Alexandra Adler—*Macmillan,* 88 p., $1.75. A practical application of "individual psychology" by the neurologist daughter of its founder.

Science News Letter, November 12, 1938

Natural History

NOTES OF A NATURALIST: JOTTINGS IN FIELD AND FOREST—Clarence Hawkes—*Christopher,* 127 p., $1.25. Chatty, rambling, informal musings about trees and grass, birds and mammals—rather in the "written conversation" style. If you like outdoor things, you'll like this little book that talks about them.

Science News Letter, November 12, 1938